

## CLAIMS

1. An inkdrop printer having a multi-segment printhead comprising:
  - two or more print engine/controllers, each configurable to be coupled with others to drive the multi-segment printhead;
  - 5 a memory buffer for receiving compressed page data;
  - image decoders to perform an expansion, in pipeline fashion, of the compressed page data;
  - a half-toner/compositer to composite respective strips of the decoded image planes; and
  - 10 a printhead interface to output the composite strip to the printhead the printhead interface including:
    - a multi-segment printhead interface outputting printhead formatted data; and
    - a synchronization signal generator outputting a synchronization
    - 15 signal to couple the print engine/controllers to synchronize their respective strips at the printhead.
2. The printer of claim 1 wherein:
  - the printhead interface is adapted to receive an input signal which
  - 20 determines if the print engine controller is a master controller or a slave.
3. The printer of claim 1 wherein:
  - the pipeline fashion expansion further comprises the expansion, in parallel, of a JPEG-compressed contone CMYK layer and at least one other layer.
  - 25
4. The printer of claim 3 wherein:
  - the other layer is a Group 4 Fax-compressed bi-level black layer.
5. The printer of claim 4 wherein:
  - 30 the pipeline fashion expansion further comprises the expansion, in parallel with the layers, of a Group 4 Fax-compressed bi-level dither matrix selection map.

6. The printer of claim 1, wherein:  
the half-toner/compositor further comprises a tag encoder for encoding bi-level infra-red tag data from the compressed page data.
- 5 7. The printer of claim 3 wherein:  
the pipeline fashion expansion further comprises a second stage dithering of the contone CMYK layer using a dither matrix selected by the dither matrix select map.
- 10 8. The printer of claim 7 wherein:  
the second stage further comprises a compositing of the bi-level black layer over a resulting bi-level K layer.
- 15 9. The printer of claim 8 further comprising:  
the second stage further comprises the generation of an infra-red layer.
10. The printer of claim 8 further comprising:  
the second stage further comprises the generation of a fixative layer.
- 20 11. The printer of claim 10 wherein:  
the fixative layer is generated at each dot position according to the need in a C, M, Y, K or IR channel.
- 25 12. The printer of claim 1 wherein:  
the pipeline fashion expansion is performed using a high speed serial interface, a standard JPEG decoder 28, a standard Group 4 Fax decoder, a half-toner/compositor unit, a tag encoder, a line loader/formatter unit.
- 30 12. The printer of claim 11 wherein:  
the decoders and encoder are buffered to the half-toner/compositor.
13. The printer of claim 12 wherein:  
the high speed serial interface is an IEEE 1394 interface.

14. The printer of claim 1 wherein;

the half-toner/compositor scales input image planes under control of a margin unit set to establish print data for a strip of the image.

5 15. The print engine/controller of claim 1, wherein:

the half-toner/compositor has as an input, an expanded contone layer, an expanded bi-level spot1 layer, an expanded dither-matrix-select bitmap and tag data.

16. The print engine/controller of claim 15, wherein:

10 the half-toner/compositor includes a margin unit to apply margin data to the respective image planes during the composite process to generate print data in strips.

17. The print engine/controller of claim 15, wherein:

15 the half-toner/compositor scales input image planes under control of a margin unit set to establish print data for a strip of the image.

18. The print engine/controller of claim 17, wherein:

20 the half-toner/compositor further comprises a number of scale units, each scale unit receiving data from a buffer layer and at least one scale unit receiving two control bits, the control bits being an advance dot bit and an advance line bit.